AMENDMENT TO CLAIMS

Amend claims 19, 20, 21 and 22 as set forth below and add new claim 23.

19 (Currently Amended) A method for enhancing the capabilities of a portable, hand-held lightweight thermal imaging instrument ~~such as Mikron Infrared Company's Model # 7200~~, so as to permit the thermal imaging of target surface(s) having lower temperatures typically in a first range between -40°C and 500°C or, alternately, but not contemporaneously, of target surface(s) having higher temperatures typically in the range between 400°C and 2000°C, so that the actual true temperature of the target surface(s) within an acceptable degree of accuracy can be made, the thermal imaging at least in the higher temperature range accruing in an environment where there is the presence of unwanted radiation from the surrounding background, including at least a first source of unwanted radiation, said unwanted radiation adversely affecting the determination of the actual true temperature, the target surface having a known absorptive wavelength, the thermal imaging taking place through intervening media having a known transmission wavelength, the instrument including a housing (12) having an opening (14) for admitting infrared rays including those emanating from said target surface(s), said rays directed along an optical path within said housing, said optical path having an optical axis (38), an optical assembly (40) positioned within said housing and in said optical path, said optical assembly having an input and an output, said infrared rays directed towards and into said input, through and out of said output of said optical assembly, said optical assembly including an objective lens (74), a negative lens (76), and focusing lens means (18, 82, 84), an un-cooled focal plane array, infrared ray

detector(UFPA detector) (48) including a detecting surface (86), said UFPA detector positioned in said housing and in said optical path so as to allow the impingement of the infrared rays passing out of said optical assembly onto said detecting surface, said UFPA detector further including a spectral transmission window (84) positioned in said optical path between said output and said detecting surface, said UFPA detector providing an electrical output proportional to the energy of the infrared rays impinging onto said detecting surface, the method comprising the steps of:

(a) disposing and ~~coaxial ly~~ coaxially aligning each of said lenses along said optical axis;

(b) employing germanium lenses with an anti-reflection coating having a spectral band width of 3um to 14um for each of said lenses forming said optical assembly;

(c) employing a spectral transmission window that has a spectral band width of 3um to 14um for said spectral window associated with said UFPA;

(d) employing an infrared filtering means (44) including a first (78) and second (80) infrared band pass filter, said first infrared band pass filter having a pass band centered at a wavelength in the bandwidth of 8 to 14um, said second infrared band pass filter having a pass band centered at a wavelength in the bandwidth of 3 to 8um, said pass band of at least said second band pass filter having a spectral bandwidth of approximately 0.2um, the respective center wavelength of said pass band of at least said second infrared band pass filter ~~each said pass bands~~ approximating the known transmission wavelength of the intervening media and/or the absorptive wavelength range of the targeted surface;

(e) providing means on said instrument to be activated by an operator whereby one or the other of said band pass filters is interposed in said optical path depending on the temperature range of the target surface, said first infrared band pass filter interposed

when the temperature of the target surface(s) is in the first range, said second infrared band pass filter interposed when the temperature of the target surface(s) is in the second range ~~range,~~;

(f) providing electronic means responsive to said electrical output of said UFPA including programming said electronic means with at least respective algorithms, relevant constants and emissivities for processing said electrical output of said UFPA detector so as to calculate the temperature of the targeted surface, whether the targeted surface has a temperature in the first range between -40°C and 500°C, or alternately has a temperature in the second range between 400°C and 2000°C, said electronic means providing at least one interpretable output (26, 28, 30, 32, 72) whereby the operator is presented with information sufficient to determine the actual true temperature(s) of the target surface(s) within an acceptable degree of accuracy,

the step of programming said electronic means including storing data relevant to the environment and to a determination of the actual true temperature, and further including programming a sufficient number of data processing steps wherein the adverse effect of said unwanted radiation on the determination of the actual true temperature is substantially minimized.

20 (Currently Amended) The method claimed in claim 19 wherein a second infrared band pass filter is selected wherein said spectral bandwidth is ~~having a pass band~~ centered at approximately 3.9 um wavelength.

21 (Currently Amended) The method claimed in claim 19 wherein a second infrared band pass filter is selected wherein said spectral bandwidth is ~~having a pass band~~ centered at approximately 5.0 um wavelength.

22 (Currently Amended) The method claimed in claim 19 wherein a second infrared band pass filter is selected wherein said spectral bandwidth is ~~having a pass band~~ centered at approximately 6.8 um wavelength.

23. (New) The method claimed in claim 20 wherein the environment for the high temperature range is the interior of a refractory furnace having a known geometry and having a plurality of boiler tubes, where the target surface is the surface of one of said plurality of boiler tubes, the target surface being viewed by said instrument through at least one of a successive number of view ports, and wherein the sources of unwanted radiation include the hot combustion gases, at least one wall of the refractory furnace and at least one boiler tube other than the one having the target surface, and wherein part of the data to be stored relevant to the environment includes a view factor coefficient for each of said at least one of a successive number of view ports.